

## CLAIMS

What is claimed is:

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1. A method of channel balance for a channel balance section in an optical network with a starting node, an ending node and a plurality of intermediate add/drop nodes which further has a plurality of wavelengths, comprising steps of:

10 determining express channels and non-express channels starting from said starting node;  
     for each said express channel:  
         calculating a transmitter power change in said starting node that brings said express channel to a predetermined channel performance value;  
     for each said non-express channel:  
 15 calculating a transmitter power change in said starting node for said non-express channel;  
     for each said add/drop node:  
         determining channels added via said add/drop node; and  
         calculating a transmitter power change in said add/drop node for said  
 20 added channel.

2. The method according to claim 1 wherein the step of determining express channels and non-express channels is based on a wave path table.
- 25 3. The method according to claim 1 wherein the step of calculating transmitter power change for each express channels further includes determining the difference between the actual channel performance and said predetermined channel performance.
- 30 4. The method according to claim 1 wherein the step of calculating transmitter power change for each express channel further includes a linear relationship between transmitter power change and channel performance change.

5. The method according to claim 1 wherein channel performance is optical signal-to-noise ratio.
- 5 6. The method according to claim 1 wherein channel performance is channel power.
7. The method according to claim 1 wherein channel performance is bit error rate.
8. The method according to claim 1 wherein channel performance is Q value.
- 10 9. The method according to claim 1 wherein predetermined channel performance value is the average channel performance value of all express channels.
10. The method according to claim 1 wherein predetermined channel performance value is based on a user-defined output power spectral shape.
- 15 11. The method according to claim 1 wherein predetermined channel performance value is based on a user-defined output optical signal-to-noise ratio spectral shape.
- 20 12. The method according to claim 1 wherein channel balance for each said express channel is implemented as a multiple iteration process.
13. The method according to claim 1 wherein the step of calculating transmitter power change for each non-express channel includes setting new transmitter power equal to the mean value of the transmitter powers of two express channels adjacent to said channel.
- 25 14. The method according to claim 1 wherein the step of calculating transmitter power change for each added channel in an add/drop node includes setting new transmitter power equal to the mean value of the transmitter powers of two express channels adjacent to said channel.
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15. The wave path table in claim 2 records for each channel its transmitter node and receiver node.

16. The determination of adjacent express channels in claim 13 is based on ITU  
5 wavelength frequency.

17. The determination of adjacent express channels in claim 14 is based on ITU  
wavelength frequency.